OCCUPATIONAL HEALTH *Review*

A Quarterly Publication

HAMILTON
OCT 3 1956

VOLUME 8
NUMBER 2

JULY 1956

Topics

OCCUPATIONAL HEALTH

RADIATION

CIVIL DEFENCE

and

REHABILITATION

Occupational Health Division

DEPARTMENT OF NATIONAL HEALTH AND WELFARE, OTTAWA

Occupational Health Review

Volume 8, Number 2, July 1956

The Occupational Health Review is published by the Occupational Health Division, Department of National Health and Welfare, Ottawa, with the cooperation of the Department's Information Services Division and under the authority of the Minister, the Hon. Paul Martin.

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COVER PLATE

The cover photo, illustrating a phase of rehabilitation, is presented through the courtesy of Miss Constance Lethbridge, Executive Director, Occupational Therapy and Rehabilitation Centre, Montreal, P.Q.

Integration of OCCUPATIONAL HEALTH INTO PUBLIC HEALTH*

by
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There is always a tendency to regard any study or practice which cannot be pigeonholed or classified as an exotic and remote specialty. For this reason it is as well to emphasize that occupational health should never be regarded as something apart or special. It is essentially a very vital cog in the total machinery of preventive medicine endeavour, an integral part of the whole picture of public health.

Looked at in this light, it is quite evident that occupational health must, then, be of concern to every local health authority and Medical Officer of Health. As the educationist claims to be interested in teaching the "whole child", so the Medical Officer of Health, by the very nature of his position, requires to know and supervise, the health of the "whole lives" of the people of his district. And organized occupational health services provide the ideal medium for the continuation into adult life of the program of preventing illness started in the well-baby clinics and schools.

The Changing Targets of Public Health

Perhaps it is treading on controversial ground but it does appear that in the days gone by the objectives and aims of public health were much more clearly defined than they are today. "Public health then was more like a crusade", Dr. Sowder states in a paper published recently, in which he points out diseases such as typhoid fever acted as most dramatic arguments for the need for effective public health measures.

Today many of the old traditional enemies such as malnutrition, high infant and maternal mortality rates, the scourges of diphtheria, smallpox, impure water supplies, inadequate sewage disposal—all are virtually conquered (or, at least, the methods of victory are known). The public health worker is left with a less heroic, but equally onerous duty, the prosaic task of "holding the line". In addition there are these problems of public health, which are so hard to crystallize and clarify their value to the public, but which are just as important as the conquest of the ancient foes.

In the quest for a new clear-cut target, it is wrong that the claims of occupational health should be overlooked. Recent evidence from the United Kingdom and America suggests that this is becoming recognized and there is a growing awareness of the need for a much closer integration of this field into the sphere of traditional public health work. A recent publication of the Society of Medical Officers of Health from Britain points out the fact that under existing statutes only very limited powers of preventing illness in places of work are given to the Medical Officer of Health and that much more is required for the protection of the community health, particularly in areas with a high degree of industrialization. In the U.S.A. state departments are becoming very conscious of the need to have efficient divisions of industrial hygiene within the department organization. The State Commissioner of Health for New Jersey expressed a general feeling recently when he said "It would seem to me, as a public health administrator, that my hopes and plans for adult and occupational health should be based upon co-ordinating public health practices".

The Role of the Local Health Authority in Occupational Health Practice

In considering the ways in which the various members of the local public health team can play their part in promoting sound health practices in the industries and occupations in their districts, only a few ideas can be broached here. The potentialities are, of course, almost boundless, but there should be no necessity to sell occupational health to those who are already devoting their time to the prevention of illness.

Briefly it may be as well to consider some of the ways in which the individual members can contribute their share. The Medical Officer of Health will, of

*Reprinted from Canadian Journal of Public Health, Vol. 47, No. 2, February 1956.

course, have an overall picture of his whole district. It is not envisaged that he would in any way infringe upon the duties or sphere of activity of those physicians who are already giving service as industrial medical officers. It might be suggested though that a much closer liaison might be developed whereby the Medical Officer of Health can ascertain from the industrial physicians something of the incidence of communicable diseases etc. which are occurring in the plants under their care. As has been pointed out, the great bulk of sickness in employed persons is from the ordinary diseases prevalent in the community, and not specific to industry itself.

When a town or village is considering expansion then is the time for the "City Fathers" to consult their Medical Officer of Health. He can advise on the suitability of their plans for industrialization, the adequacy of their health facilities and so on. Further it would be a big step if all plans for industrial buildings should first have to have the consideratation of the Medical Officer of Health. It is felt that, in the small industries particularly, the Medical Officer of Health can give invaluable assistance in advising employers both in their environmental plans and in many of their personnel problems. A close comparison here is the role of the Medical Officer of Health at work with the restaurant proprietor. A good example of the part which a Medical Officer of Health can play can be seen in the way in which the Medical Officer of Health of Kitchener, Ontario, assisted in fathering the outline of the present pilot study for small plant health services. This project has been made possible by National Health Grants and through the keen interest and supervision of the Ontario Industrial Hygiene Division.

Now a few brief thoughts might be given to the ways in which the public health nurse can participate in this work in her community. It is envisaged that perhaps the most effective help can be given by the nurse through home visiting. Already there is in many areas a considerable amount of close liaison between the nurses in industrial plants and their "opposite numbers" from the local health department.

Where this occurs there is immense benefit not only to the community but to the physicians, and the workers in the various plants. By this liaison, the occupational health nurse can obtain assistance for an employee worried about the health of his family. In the reverse direction, the public health nurse can get her "message" through to that member of the family who is normally absent from home when she calls.

Although it is a slight digression, the fact should be mentioned that all people are not the same. This appears a very blatant truism but is often forgotten in this day and age. The individuality of people, the fact that they do not, and should not be expected to think the same way must never be forgotten. This fallacy of the herd aspect is often overlooked particularly by busy workers who are trying to deal with the problems of many people.

Finally turning to the sanitary inspector, it seems clear that the supervision of workshops, stores, factories, is a very logical addition to his duties. Much of the work would be essentially the same, in the maintenance of a cleanly and healthful environment. He is eminently the person who could take full advantage of further short courses in accident prevention, protection of machinery, basic knowledge of the toxic substances and so on. With this addition to his armament he could play a most valuable part in community occupational health activities. It is perhaps of interest to note here that certain branches of the Armed Services are thinking on these lines and in the early part of this year a course was run by the Occupational

Health Division in Ottawa, for hygiene assistants from the Regular Forces.

It will be seen from these few brief thoughts that no attempt has been made to explore the total range of the contribution which is possible by staff members of the local health authorities. It is fairly apparent that this contribution is most needed in the smaller communities where the small plants are found. The tendency in the larger plants is now to have their own occupational health services under the direction of an industrial physician. Obviously the assistance of the local health authorities is not here so necessary though close co-operation is clearly of greatest benefit to all concerned. But it is in the small plant where health services are largely non-existent or very rudimentary that help is needed and it is from this beginning that the whole field of occupational health will grow.

The Dividends from Occupational Health Services

Although to the public health worker the advantages of occupational health services seem obvious, it is well from time to time to summarize the advantages of a sound health service. To the professional public health worker the biggest gain is in a job well done, reflected in a more healthy community as a whole.

It is a little more difficult to point out the advantages of an effective health service to the employer who has to foot the bill to an extent. In a brief concise way a recent memorandum from the Division of Industrial Hygiene of Quebec cannot be bettered. It summarizes the advantages as follows:

"It helps to improve worker efficiency and productivity

It helps to raise morale among employees giving evidence that management has a sincere interest in its employees and their welfare

It helps to reduce accident and insurance costs

It helps to reduce absenteeism (surveys have shown as much as 29%)

It helps to reduce labor turnover (surveys have shown as much as 27%).

It helps to reduce occupational diseases (surveys have shown as much as 63%)

It improves the quality of the working force by attracting a higher calibre of personnel

It adds another important channel of communication with employees through the benefit of the trained observation powers of professional men and women of high integrity

It raises the standard of the organization in the eye of public opinion"

Conclusion

No attempt has been made to cover the vast scope which can be achieved by a closer knitting of occupational health into the community health program. These have been a few suggestions upon which it is hoped many will be able to build their own ideas.

It does seem that occupational health as well as the control and prevention of occupational diseases will not truly come into its own until it is accepted by all as a part of the normal program of public health activities. Specialists and consultants are, of course, essential at the various levels of administrative authority, but the field work, the sympathetic teaching, and the helping hand on the spot, should come from those who are already doing this. A sentence taken from the report of a committee of the American Public Health Association summarizes the position when it states "The Committee feels that there is an untapped reservoir of opportunities in occupational health at the local health department level. Not only the development of pure industrial health activities by local health departments, but the use of occupational groups as a medium for the appreciation of traditional health department functions needs to be exploited".

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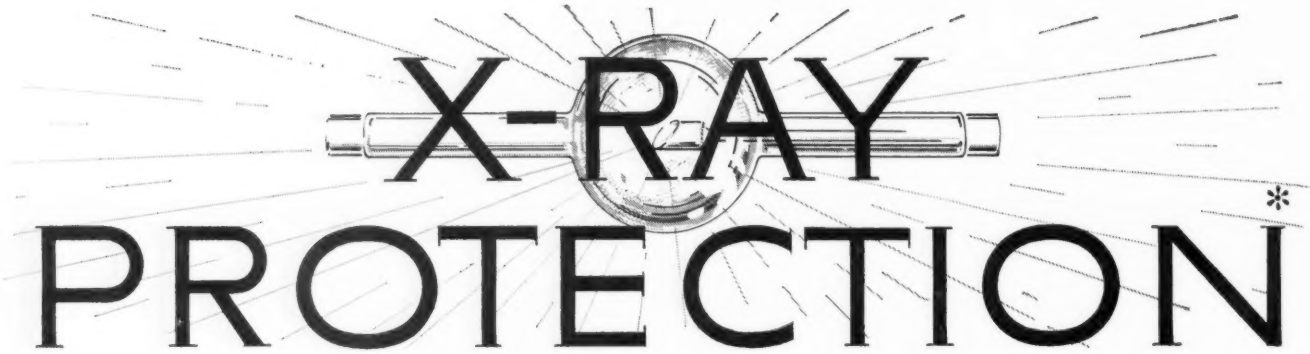

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by

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During the last few years there has been an increasing awareness of the need for radiation protection. Most of the recent emphasis has been concerned with the expanding use of nuclear energy, but at the same time it should not be forgotten that many people are exposed to X-rays during their lifetime.

It has been estimated that over 200,000 persons in the United States are potentially exposed to X-rays in the course of their work. (1) On this basis one might estimate that in Canada there are over 10,000 people occupationally exposed to X-rays. In addition to this number there are many more who receive radiation exposures during medical investigation or treatment. For example, over three million Canadians received a chest X-ray in 1953; (2) many other examinations were performed by doctors, dentists, chiropractors, osteopaths, chiropodists and shoe salesmen. From this it can be seen that a considerable portion of the population is exposed to X-rays. It is the purpose of this report to show that fairly simple means are at hand to reduce the total exposure to the individual, without interfering with necessary diagnostic or therapeutic procedures.

The International Commission on Radiological Protection (I.C.R.P.)

This body has been in existence since 1828, and from time to time it has issued recommendations on various aspects of radiation protection. The latest recommendations were published in 1955, (3) and covered topics such as maximum permissible exposures, and protection against X-rays. A summary of the recommendations of the I.C.R.P. and a pamphlet entitled "Protection Against X-Rays" have been prepared by the Department of National Health and Welfare, and can be obtained from Radiation Services, Occupational Health Division, Department of National Health and Welfare, Ottawa, Ontario.

Maximum Permissible Dose

As we have seen, X-ray protection is concerned with two main groups of people—patients and operators, the latter group including doctors, dentists, technicians, etc. The I.C.R.P. recommends maximum permissible doses of radiation for each group. For radiation workers it recommends that the weekly dose should no exceed 300 milliroentgens for whole-body exposure, and 1500 milliroentgens for exposure of isolated parts such as the feet and hands. The Commission emphasizes that all exposures should be reduced to the minimum and that the accumulated dose in any one year should not exceed 5000 milliroentgens for total body exposure. In practice these levels are not restrictive, and the great majority of radiation workers receive much smaller doses. However, there is still a small group who, through ignorance or carelessness, expose themselves to unnecessarily large doses. The author has heard of two radiation burns resulting from fluoroscopy during the past year or so. Most radiation workers have seen the injured fingers of some of their older colleagues, and know of the possibility of blood diseases resulting from over-exposure to radiation. These things should not happen if care is taken to maintain the exposure to accepted limits.

In the case of the prolonged exposure of a large population, the I.C.R.P. recommends that the maximum permissible levels should be reduced by a factor of 10 below those accepted for occupational exposures. This recommendation has been made because of the possibility of genetic changes resulting from a generalized increase in radiation exposure. For this reason it is recommended that the exposure of patients should be reduced as much as is compatible with successful diagnostic investigation or therapeutic treatment.

Protection of the Patient

The dose to a patient can be reduced by keeping the mAs value as low as possible, and it is obvious that this is particularly important in the case of fluoroscopy. The use of aluminum filters is an important means of reducing the exposure to the patient, without detracting from a radiograph or a fluoroscopic image. At least 2 mm. of aluminum should be used for all X-ray diag-

*This article was originally published in the Canadian X-Ray News Letter, Volume 12, No. 1, produced by Du Pont Company of Canada Ltd.

nosis, and 3 mm. for thick parts of the body. The aluminum reduces the lower energy X-rays which do not contribute to the picture or the image, but which do add to the exposure. For instance, 3 mm. of aluminum may halve the dose-rate of a beam having an original intensity of 10-20 roentgens per minute.

It is important to keep the cross-section of the beam that strikes the patient as small as possible. In this way the volume of irradiated tissue is kept to the minimum. The beam size can be controlled by means of cones, shutters, or diaphrams, and in addition it may be advisable to provide extra shielding for the gonads. For genetic reasons it is highly desirable that the gonads should not be irradiated unnecessarily.

Protection of X-Ray Workers

Specific recommendations about equipment and procedures for fluoroscopy and radiography are given in the I.C.R.P. report and in the pamphlet "Protection Against X-Rays". In general, however, it can be said that X-ray workers should avoid unprotected exposure to the direct beam, and should make sure that their exposure to scattered radiation is within acceptable limits.

Direct Beam

The direct beam is the chief source of hazard,

because of the extremely high dose-rate, which may be in the region of 5-50 roentgens per minute. Radiation workers should not assist in holding patients, but should use restraining devices; if it is absolutely necessary to hold a patient or a film,this should be done by someone who is ordinarily not exposed, and even then he should wear protective clothing.

Fluoroscopy is the chief source of hazard because of the length of time during which X-rays of high intensity are being emitted Steps should be taken to reduce the output of the machine as far as possible. This can be done by using low milliamperage and high kilovoltage, incorporating at least 2 mm. of aluminum as a permanent filter, and using cones and diaphragms to reduce the size of the X-ray beam. The time of screening should be kept to the minimum and the fluoroscopist should be sufficiently dark-adapted before starting an examination. The use of red goggles will reduce the time required for dark adaptation.

Protective gloves and other clothing should always be worn during fluoroscopy. The extent to which other protective clothing is required in any particular case is best found by determining the actual exposure of various parts of the body under normal working conditions. This can be done by wearing pocket ionization chambers or film badges on the limbs and trunk. In Canada, the film monitoring service of the Department of National Health and Welfare is available for this purpose.

Scattered Radiation

As a rule, exposures received from scattered radiation are much smaller than those from the direct beam. Doses should be very small if care is taken to remain behind the control panel when exposures are being made. At the same time it is helpful to know the exposure being received, which can be done by wearing pocket ionization chambers or film badges. Appropriate remedies can be taken if exposures are found to be high.

Some of the more important aspects of protection in a diagnostic X-ray department have been mentioned. No attempt has been made to go into details, which can be obtained by writing to Radiation Services, Occupational Health Division, Department of National Health and Welfare, Ottawa, Ontario.

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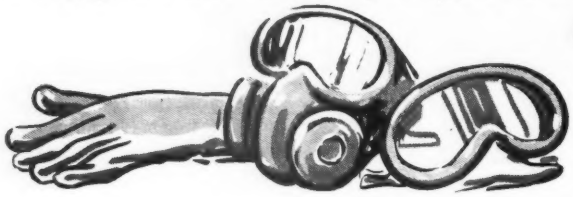
CONFERENCE · BRITISH OCCUPATIONAL HYGIENE SOCIETY

The Use and Abuse of PROTECTIVE EQUIPMENT*



The fifth Conference of the British Occupational Hygiene Society under the above title was held in London on 4th November, 1955. It was divided into four sections dealing, respectively, with the protection of the lungs, skin, eyes and feet.

The morning session was opened by Mr. S. H. Wilkes, Senior Chemical Inspector of Factories, who gave a warning that the canister respirator, which was an excellent device in its own proper field, should not be used inside closed spaces where there might be high concentrations of poisonous substances or a shortage of air. An air line respirator fed with fresh air from a hand pump should always be used in such situations.

Papers on the protection of the lungs were presented by Mr. A.C. Peacock, of the Chemical Defence Experimental Establishment, Porton, and by Mr. J. Whittaker, of the Central Safety Department, Imperial Chemical Industries, Ltd.

Mr. Peacock stated that protection of a worker by means of a respirator must be regarded as a second-best substitute for tackling the hazard at its source because there must always be some loss of efficiency and difficulty in inducing him to wear it.

The design of a respirator has to be considered as a whole; vision, comfort and speech characteristics must be combined with lifetime and breathing resistance. It was also important that the hazard against which it was to be used should be fully specified so that the most appropriate kinds of filter could be incorporated.

Gases and vapours were absorbed by activitated charcoal which was suitable in most cases unless the molecular weight was too low; impregnation with catalysts was then resorted to. Ammonia, oxides of carbon and the oxides of nitrogen needed special absorbants. Aerosols were taken out by fibrous filters in the form of paper, carded lap or felted fabric.

The fit of the facepiece was important as contact with the skin had to be maintained during violent movement of the head without the use of excessive pressure. It had been established that a plain polished surface gave better contact with dry skin than a roughened one.

For many industrial applications it should be remembered that a massive standard of protection was unnecessary and led to over-complication.

Mr. Whittaker emphasized that the prevention of lung injuries began with good design of buildings, processes and plant, followed by the use of sound operational methods, and the training and control of personnel, with the use of personal protective equipment as a last resource which is, in fact, required by law in certain operations.

The importanace of the fit of facepieces was mentioned as being easier to secure with full-size face masks, going under the chin, than with the small type covering only the mouth and nose.

The larger the protective appliance, however, the greater was the aversion of the worker to wearing it and the greater the risk of its being surreptitiously discarded. Workers in the older industries were difficult to discipline in this matter and propaganda based on fear or a humorous appeal was deprecated. The atomic energy industry was exceptional and fortunate in that its employees were well aware of the danger of their working conditions and co-operated fully in the precautions advised.

The discussion on protection of the lungs was opened by the President of the Society, Dr. J. H. Rogan, Chief Medical Officer of the National Coal Board, who asked about the limits of resistance to breathing which could be tolerated by men working with different energy outputs. Other points raised included the possible advantage of testing canisters with tidal, rather than steady, air flow, and the superior performance of certain continental respirators in respect of resistance and its rise during use; this was probably due to their incorporating pleated paper dust filters.

*This summary was prepared and submitted by C. N. Davies, D.Sc., F. Inst. P., Hon. Editor of Transactions, London School of Hygiene, London, England.

A difficulty with canisters was the lack of visual indication of the amount of useful life left in them, which depended not only upon the concentrations of gas in which they had been used, but also upon the rate of breathing. In assessing the danger of a dust it had to be remembered that the intratracheal toxicity was usually many times greater than the oral figure.

The co-operative attitude to protective measures of workers in atomic energy establishments was put down to their being accustomed from the start to hazards outside human perception, to their being given full information about the risks and to good discipline.

The second section of the Conference, on the protection of the skin, consisted of papers by Professor J. R. Squire of the Department of Experimental Pathology, University of Birmingham, and Dr. A. Lloyd Potter of the General Chemicals Division of Imperial Chemical Industries Ltd.

Professor Squire gave an account of the structure of human skin and explained the mechanisms by which various kinds of damage could result. The outer layer of the epidermis was chemically inert and resistant to acids, but it swelled in alkalis and, being a protein, could react with, absorb and transmit substances which contained $-NH_2$ or -SH groups. It was also liable to be destroyed by reducing agents and cracked if dried excessively. Normally loss of water was impeded by the fatty surface film so that removal of this by solvents might result in "chapping". The fatty layer was replenished in about two hours.

Sheer mechanical abrasion was encountered in some occupations. The horny surface of the skin was constantly replaced from the germinal layer, and if the rate of abrasion was too high, and gloves could not be worn, a shorter shift was the only remedy.

Chemical agents acting as irritants produced their effect in 48 hours or less, but sensitizing chemicals might produce intense reaction on a second exposure 10 or 14 days after the initial one. Once sensitized to a specific chemical a man could react to minute traces of it. Complete removal to another occupation was necessary in these cases. Carcinogens required years to produce even the pre-cancerous effects and the peak incidence of the cancers was 20 to 30 years after exposure, their action was dependent on repeated exposure and could be reduced by lessening the amount of carcinogen reaching the skin.

Mechanical handling avoided many risks but was not applied to many jobs of low economic value; for such occupations personal protection was necessary. The organization of protective equipment should include provision for inspection, repair and cleaning. There was a risk of transferring contamination to the person when soiled clothing was removed. Barrier creams could be relied on to exclude a toxic chemical only in exceptional instances.

Dr. Lloyd Potter stated that although occupational dermatitis was not notifiable to the Chief Inspector of Factories, over 3,000 cases were voluntarily reported to him in a year. In order to affect the skin a substance must wet it, either by being itself in liquid form or by solution in perspiration or other liquid present on the surface of the skin. Water, alcohol and weak acids did not greatly affect the cells of the skin, but they were

easily damaged by alkalis and fat solvents which penetrated the natural greasy barrier and reached the sebaceous layer. Dermatitic agents fell into two groups: primary irritants and skin sensitizers. It was almost impossible for the employee who was liable to contract dermatitis to be detected, before employment, by medical examination; regular examination subsequently was very important, however.

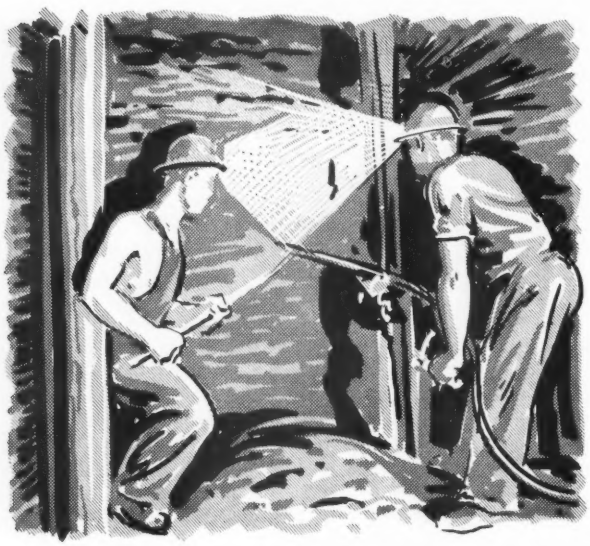
The ideal method of protection was by complete enclosure of a process, but this could be nullified if, for example, packing of the final product was done by

hand. Protective clothing should be neat and effective; it should not add to the risk of contracting dermatitis by causing sweating and chafing. Inspection, laundering and repair should be organized and the wearer should be educated by precept and example. Proper washing facilities were important and barrier creams had their place, if only because they encouraged washing.

In the discussion Professor Squire stated that the pH of the skin was about 4.5 or 4.6, partly due to carbon dioxide transpiration and partly to free fatty acid in the surface film. The fatty acid layer gave important protection and might be disturbed by long exposure to alkalis.

Several speakers referred to the problem of cleaning the hands, which was certainly facilitated by the use of barrier creams.

Introducing the speakers in the afternoon session of the Conference, Sir Harold Roberts, Chief Inspector of Mines, stated that mining was the most dangerous of all major industries. The death rate in coal mining was nine times as high as the death rate in factories. The absolute figures were improving, but relative to employment in factories there seemed to be little change. Major catastrophes were responsible for only a very small proportion of the casualties in mines; the major toll was taken by falls of ground and transport operations.



Injuries to the feet and ankles were common and the wearing of safety boots bearing the British Standard mark was encouraged, but there was a long way to go before they were universally adopted by all workers. It was even more difficult to get the underground worker to wear goggles. Even the slightest interference with vision was trying and might create additional risks. Improvement in lighting had, however, made a real contribution to safety; the number of injury benefits for miner's nystagmus was only about 150 a year. This was an interesting example of the maxim that it was better to remove causes than to treat effects.

The President stated that the fatal accident rate in British mines was half the German rate, one-third of the American and lower than that of any other mining country except the Netherlands.

Dr. D. R. Campbell, Director of Research, Birmingham and Midland Eye Hospital, then read her paper on "Ocular Injuries and Hazards". She stated that eye injuries constituted 4.26 per cent of all industrial accidents; most of them were due to flying particles and were often preventable. In addition, there were thousands of minor injuries from the same cause which were not reported because they caused less than three days's absence from work. The risk was greatest in metal foundries and heavy engineering.

In the matter of eye protection it was disheartening to find so many goggles which steamed up, restricted vision and were uncomfortable to wear. The issue of goggles to every individual worker, each being given a choice of four designs, in a large engineering factory had demonstrated that a great decrease in eye accidents could be achieved.

Ocular injuries could often be repaired now that the complication of infection was largely absent; all the same, even a small scar in the centre of the cornea could cause disability by dazzle in artificial light. Eye protection should be compulsory in occupations involving striking and chipping with a metal tool. Burns from molten metal and chemicals, especially caustic soda, were dangerous. Immediate irrigation with water might be the means of saving the eye.

In his paper on "Eye protection, types of equipment and their use", Mr. G. V. Thom, Plastics Division Safety Officer, Imperial Chemical Industries Ltd., explained the legal obligations to provide eye protection against certain hazards which are laid down by the Factories Acts and are required by common law.

Built-in protection upon the machine, rather than its operator, was desirable and he showed illustrations of typical methods of applying this principle.

Personal eye protection included spectacles, which could have prescription lenses made in safety glass, eye shields covering a part or all of the face, and goggles. Protection against infra-red rays was needed in welding, and against ultra-violet rays as well in electric arc welding, which necessitated screening the whole of the face. British Standards for protective appliances were in existsence. Persons with monocular vision should be given special attention because of the risk of total blindness, particularly because the existence of their disability might be unsuspected by the works personnel.

It was suggested in the discussion that old hammers and chisels with mushroomed heads were a com-

mon source of intraocular foregn bodies; the risk was decreased by regular replacement of worn tools. Limitation of field of view by goggles, especially downwards, and interference with binocular vision discouraged their use. Other points raised were the need for safety glass, plastics which were not inflammable and the fact that coloured glass which gave protection against radiation from flame welding might be useless for arc welding.

Mr. H. Bradley, Director of the British Boot and Shoe and Allied Trades Research Association, spoke first on the protection of the feet and was followed by Mr. H. E. Thomas, Head of the Safety Department of the Ford Motor Company, Dagenham.

Mr. Bradley outlined the steps which had led to the drafting of a British Standard for safety footwear. These contain a steel toe-cap which has to resist an impact test.

In the experience of Mr. Thomas the standard safety boot or shoe did, in some instances, give protection, but many cases of toe fractures while wearing them continued to arise. He therefore suggested that the metal toe box be extended further back, even though this meant it would be unable to pass the impact test. This did not appear to matter, however, because many accidents had occurred in which heavy objects had considerably deflected the toe box without any injury to the worker's foot. The reason for this appeared to lie in the rear edge of the toe box terminating above the thin centre parts of the innermost of the phalanges, which are dumb-bell shaped and thus are not so readily crushed.

Lack of time prevented a discussion being held on the last two papers.

A full account of the Conference appeared in the March issue of the British Journal of Industrial Safety. Reprints are obtainable from the Secretary of the Society.

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Reprints from Occupational Health Bulletin

From time to time the Division receives numerous requests for certain articles which have been published in the Occupational Health Bulletin. Since there are limited quantities of the Bulletin left after mailing, it has been necessary in the past to restrict distribution of extra copies on many occasions.

To offset this difficulty to a certain extent, we have had a number of articles from the Bulletin reprinted in folder form and these are available from your provincial Director of Health Education.

Topics reprinted to date in both French and English are:

Carbon Monoxide
Carbon Tetrachloride
Cresol and Phenol
Hazards of Grain Dust
Static Electricity
Hazards of Welding
Dangers of Spray Painting
Acids and Alkalis
Common Industrial Eye Injuries
Industrial Dermatitis

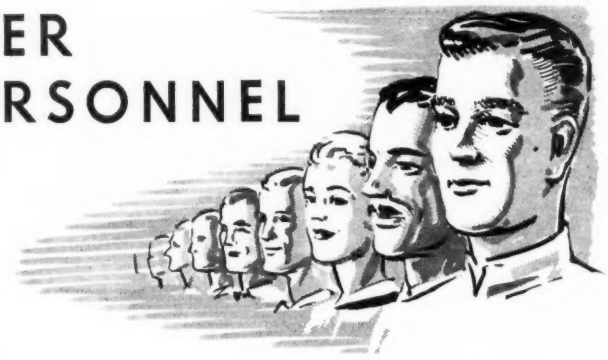
There are also the following Bulletin reprints which are available at present in English only:

Methyl Alcohol and Ethylene Glycol
Methyl Chloride and Methyl Bromide
Kerosene
Cyanides
Respiratory Protection
T N T and Tetryl
Hydrogen Sulphide
Industrial Dusts
Arsenic and Arsine

During 1955 there was a series of eight articles dealing with Small Plant Health Services printed in the Bulletin. This series has since been consolidated into a small brochure entitled, "Health Services and the Small Plant" and incorporates five major topics namely, Introduction, Objectives, Scope of Services, Ways and Means and Administration, and three Appendices, each dealing with some form of Small Plant Health Services at present in operation in Canada. This brochure printed in both English and French is available from your provincial Director of Health Education.

Additional topics will be reprinted from time to time depending on the demand.

THE ROLE OF OTHER PROFESSIONAL PERSONNEL IN CIVIL DEFENCE HEALTH SERVICES



by
Miss E. A. Pepper, R.N.,
Nursing Consultant,
Civil Defence Health Services

Before discussing the "Role of Other Professional Personnel in Civil Defence Health Services" I will deviate for a moment and briefly review the role of the doctor and the nurse in our Health Sevices planning.

DOCTORS:

Unlike the U.S.A., we are not including doctors in our primary first-aid area. Casualties will be given primary care by well-trained first-aiders working in the disaster area. They will then be brought back to a casualty collecting post, checked once again by a first-aid leader and sent on, either by hand carriage or on a four-wheeled driven vehicle to a Advanced Treatment Centre. It is at the Advanced Treatment Centre level that casualties will receive their first medical treatment and nursing care. Civil Defence Health Services planners feel that, because of the deficit of doctors in this country, we cannot afford to have doctors working in the immediate disaster area. Medical personnel must be concentrated in well equipped specific treatment centres in order that the maximum use may be made of the doctor's specialized skills. Following the chain of evacuation from the A.T.C., casualties will be sent further back to either Existing Usable Hospitals or Improvised Hospitals, or still further away to Regional Hospitals for more definite care.

Early in the planning it was realized that medical assistance would have to be provided to Welfare Services. Working on the basis of 1,000 persons within a Welfare Centre, it was decided to set up a Health Section capable of handling possibly 100 persons within each Welfare Centre. The Health Section would take care of infants and children, expectant mothers, suspected cases of infectious diseases, aged people, chronically ill or handicapped persons, as well as accident cases which might require medical first-aid. Psychiatrically trained doctors will be in charge of the Psychiatric Units set up in close proximity to Welfare Centres. In order to provide medical management to both the Health Section and the Psychiatric Unit within the Welfare Centre, we anticipate that the psychiatrist in charge of the psychiatric unit would be the nominal head of both these sections. It is our intention that psychiatrically trained nurses will serve in the Psychiatric Units and that public health nurses will be assigned to the Health Section.

In all our Health Services planning we are continually aware of the deficit of medical personnel. This fact must always be kept in mind, in order that we do not extend our medical installations beyond the availability of medical personnel to man them.

The treatment of all types of casualties has been confirmed by the medical profession and was outlined for Canadian doctors in the special Civil Defence supplement of the "Canadian Medical Association Journal" published in December, 1953.

NURSES:

Early in 1951, the Federal Security Board and the Atomic Energy Commission of the United States invited three Canadian nurses to attend the first course being given in their country on "Nursing in Atomic, Biological and Chemical Warfare". The recommendation of these nurses, outlining the initial steps to be taken to draw the nursing profession into the national Civil Defence programme, were accepted by federal authorities. An Advisory Nursing Committee to Civil Defence Health Services was set up, a Nursing Consultant was appointed and a manual on "Nursing in Atomic, Biological and Chemical Warfare" was published.

In 1952, by using the travelling teaching team technique, 660 nurse instructors across Canada were given three-day courses on the treatment and nursing care of casualities resulting from atomic, biological, and chemical weapons. These nurse instructors have indoctrinated some 30,000 graduate nurses in the basic principles of disaster nursing. Seven provinces have incorporated this information into the basic curriculum for student nurses in their hospitals and university schools of nursing. Refresher courses for the directors

of nursing education and senior instructors of our 173 approved schools of nursing across Canada have been held at the Canadian Civil Defence College, Arnprior, Ontario. Naturally, as the multiple phases of our programme develop and it expands to meet the needs imposed by the advent of larger atomic weapons, these nurse educators must be brought up-to-date and it is with this in mind that we are holding these refresher studies. It is our hope, of course, that following such action on the part of Federal Government, the remaining three provinces will incorporate Disaster Nursing into their curriculum for student nurses.

As nurses, our chief function will be:—

(a) To assist in giving life saving treatment and care to casualties brought to A.T.C.s Improvised Hospitals and Existing Hospitals.

(b) To provide continuing care to non-casualties, either in homes, institutions, or in established reception areas.

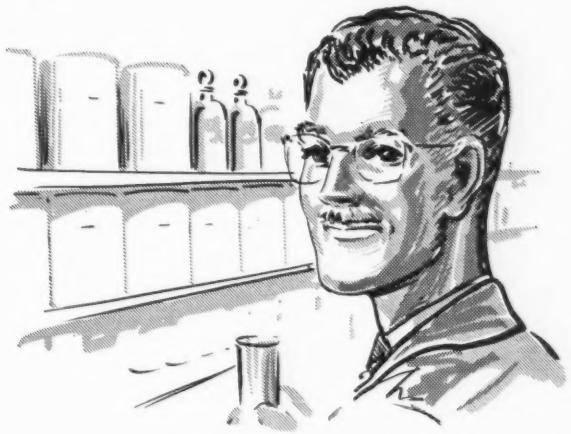
(c) To provide nursing care to ill evacuees housed in large Welfare Centres.

(d) To provide specialized nursing care to psychiatric casualties, either in the psychiatric Unit of the Welfare Centre or in the special Psychiatric Treatment Centres where more definitive care would be given.

(e) To assist in the maintenance of normal health services within the community.

(f) To train auxiliary nursing personnel during the pre-disaster period in first-aid and home nursing, and provide supervised hospital experience (44 hours) which has been arranged in conjunction with home nursing courses.

Each nurse, whether she is engaged in a hospital, industrial nursing, private nursing, or public health, has a contribution to make to the Civil Defence Health Services preparedness programme, and we are attempting to acquaint each specialized field of nursing with the particular role of its members. We are not overlooking the potential assistance of our married and retired nurses. These women are being located through provincial surveys, and are being given the opportunity to study Civil Defence Health Services planning and the responsibilities that must be assumed by the nursing profession.



In each of the provinces of Alberta, Ontario, and Quebec, a full-time nursing consultant to the Provincial Civil Defence Health Services has been appointed. Notable progress has been made in these particular provinces in preparing nurses to assist in Civil Defence Health Services arrangements. We are hopeful that other provinces will soon follow this example and appoint full-time nursing consultants for Civil Defence.

PHARMACISTS:

Other professional personnel who are preparing to accept a variety of assignments in Civil Defence are the pharmacists. Their major role would be in the following areas:—

(1) Medical Supplies:—

Due to their professional training, pharmacists would be able to accept—with the minimum amount of additional training—responsibilities at all levels for the handling of medical supplies. On them will be placed the responsibility to act as Medical Supplies Officers for A.T.C.s. and Improvised Hospitals.

(2) Laboratory Services:—

Pharmacists would seem to be the most likely professional persons to supplement the lack of trained personnel in Laboratory Services. Those pharmacists who have had previous laboratory experience, or recent graduates whose course now includes biochemistry and more extensive training in clinical laboratory techniques, should be allocated to this Service. They could be assigned to handling the Basic Clinical Laboratory Kits which will be available at the Improvised Hospital for simple laboratory tests. They may also be assigned

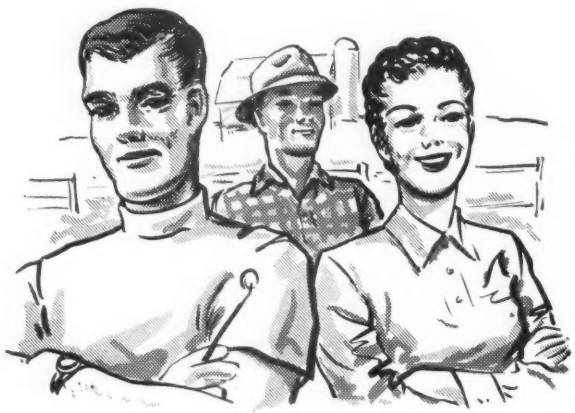
to an existing portable Public Health Laboratory to perform procedures such as major blood-grouping and cross-matching, as well as hemoconcentration-determination; white blood counts and urinalysis could also be done by members of this group. Portable Public Health Laboratories will be available to supplement existing Public Health facilities in communities overloaded by evacuees. These Units will be used for the examination of water, milk, food supplies, and the performance of other trained sanitary measures, and it is conceded that the well-trained pharmacist could assist in assuming such duties.

(3) Blood Service Techniques:—

Pharmacists in many areas are making arrangements with the Red Cross Blood Transfusion Service to acquire additional skills in blood techniques so that they may act as technicians in Bleeding Centres.

(4) Casualty Care:—

Because of a known deficit of medical personnel, pharmacists are being encouraged to extend their skills and techniques in order that they may be able to assist with casualty care in A.T.C.s, existing Usable Hospitals and Improvised Hospitals in order to assist medical personnel in their great task.



VETERINARIANS AND AGRICULTURAL ENGINEERS:

Veterinarians and agricultural engineers are being alerted regarding their role in the Civil Defence programme as persons with such training could play a major role in defence against biological warfare aimed to destroy our herds and our crops. As members of the Public Health Laboratory team, they too could assist with the services necessary for the preservation or restoration of sanitation.

DENTISTS

Although the role of the dentist has not been defined to date, it would seem logical to anticipate that members of this profession would provide assistance in the fields of casualty care, laboratory services, and anaesthesia.

DIETITIANS AND HOME ECONOMISTS:

The problem of emergency feeding is a tremendous one as it involves food procurement, distribution, and some preparation, as well as the medical aspects of both general and therapeutic nutrition.

In Health Services overall planning, dietitians in hospitals or other large scale food preparation could work with doctors and others to

(1) Recommend types and amounts of food which should be available for feeding the general public, including what to do in emergency feeding of infants, casualties, and those on special diets.

(2) Make periodic checks on the adequacy of the feeding programme for the health protection of evacuees and workers.

On a local level a dietitian would stay with her hospital and plan how to remove it to a designated building in some other area if an evacuation was indicated.

Welfare Services also have feeding operations needing the advice and action of dietitians, home economists, restauranteurs, hotel managers, and food suppliers in:

(1) Surveying regional facilities for conversion to large scale food preparation and service.

(2) Calculating bulk shipments of foods to be sent into the area of operation.

(3) Feeding evacuees, Civil Defence Workers etc.

SOCIAL AND WELFARE WORKERS:

Social Workers and Welfare Workers will have the tremendous responsibility of registering, clothing, and sheltering the evacuees, but the problem of re-uniting families will be one of their greatest and most harassing tasks. It would not be logical to bring families, who are widely dispersed through normal living arrangements, together prior to a pre-attack evacuation. Generally speaking, however, Canadians are undisciplined and will not be too receptive of this idea. Many of us do not appreciate even a suggestion of interference with our individual lives. It would seem, however, that we are all going to have to learn to take orders in the event of pending disaster. This does not imply that Canadians must be regimented but rather that they must learn to accept discipline and act according to directions given to them; otherwise we can never hope to attain any degree of organized action which is what Civil Defence is . . . "organized action by an informed public".

Professionally trained persons, by virtue of their individual expert skills and their professional and social obligations, assume a major role in any disaster. Each professional group must eventually be reached through some channel of communication and each member of that group given full information regarding the role he or she would assume in the event of a major disaster if we are to have organized action rather than utter chaos.

OCCUPATIONAL THERAPY AND REHABILITATION CENTRE

by Miss Constance Lethbridge,
Executive Director,
Occupational Therapy and Rehabilitation Centre,
Montreal, Quebec.

Miss Lethbridge, in addition to carrying her normal professional responsibilities, finds time to participate in community and national affairs as she is immediate Past-President of the Montreal (English) Branch of the Canadian Association of Social Workers, is now the Branch Representative to the National Board of the Canadian Association of Social Workers, a member of the National Advisory Council of the Canadian Association of Occupational Therapy and a member of the Advisory Board of the Cerebral Palsy Association. She is also a member of the Council for the Guidance of the Handicapped.

All too frequently, the process of rehabilitation is regarded only as a means of fitting an individual for employment following an incapacitating injury or disease, and placing him in gainful employment so that he will not be a burden to his family, the community or the state. Although this may be part of the answer, there is a great deal more to rehabilitation than effecting full or partial physical recovery and placement in a job. The ultimate goal of rehabilitation is to assist the handicapped person in attaining maximum physical, emotional, social and economic independence.

It is a complex process, the success of which hinges on the combined efforts of professional staff from such diverse specialties as medicine, nursing, physiotherapy, occupational therapy, speech therapy, psychology, casework and vocational education. It requires a wide variety of service including: Active medical care; physiotherapy and occupational therapy treatment; supportive therapy; psychometric, pre-vocational and vocational testing; placement; and post-employment review. This wide range of services necessitates a coordinated or team approach; equally important, these services may be individualized to meet the varying needs unique to any handicapped person.

Rehabilitation is, at the same time, a continuous and often lengthy process. It begins with the occurrence of the accident or the diagnosis of the disease and is not satisfactorily completed until the individual has achieved his maximum potential as a citizen of his community, within the framework of his disability.

The maximum potential for a complete invalid may be the achievement of at least some measure of self-care; for a person whose disability prevents return to his former occupation, it may mean the mastering of a new skill sufficiently well to be able to take his place on an equal basis with others not thus disabled. The results should not be measured only in terms of physical restoration and job placement; in some instances, job placement is secondary to the self-esteem and dignity associated with being independent, even to a very limited degree.

In addition, there is a great economic return from training disabled persons who cannot work to care for themselves. It will free those who have had to care for them so that they may direct their efforts towards other, more productive activities. The results of rehabilitation are endless, not only in the tremendous economic value to the country of increased productivity from rehabilitated individuals, but also in the active participation of community living of people who formerly had been left to stagnate in institutions and in their own homes—not only a burden to themselves but a perpetual drain on their families and the community.

In summary, there should not only be concern for the disability and how to overcome it—there must also be concern for the individual who has the disability. Rehabilitation consists of helping him accept his handicap; training him to develop and make use of skills he has left, or to develop new ones; helping his family to accept him and understand what his disability means to him. When the community provides rehabilitation services, accepts the handicapped, understands them, and employs them, it is not only good business but also good common sense.

Most disabled persons are anxious to regain independence following disability, but in many instances they require help. This is where such organizations as special rehabilitation centres, employing the coordinated services of a number of different professions, are making inestimable contributions to the field of rehabilitation.

The Occupational Therapy and Rehabilitation Centre, Montreal, Quebec.

History—In 1937, the Occupational Therapy Centre was formed through the amalgamation of three agencies. During the Second World War, the Mon-

treal Council of Social Agencies was asked to assess whether the work of this Centre was fully justified. The Council came to the conclusion that there was need for a survey of all facilities in Montreal devoted to rehabilitation of the handicapped and the Committee appointed for the task turned in its report late in 1949. This report led to a broadening of the objectives of the Rehabilitation Society for Cripples and the establishment of the Occupational Therapy and Rehabilitation Centre as a going concern. In 1951, this Centre took over the assets and liabilities of the Occupational Therapy Centre and undertook the development of an active rehabilitation programme.

Soon, the quarters then occupied by the Centre in the Convocation Hall of the Diocesan College on University Street, were found to be much too small and the Centre needed more space, staff, and funds. Early in 1954, through the good offices of the Montreal Council of Social Agencies and Welfare Federation and the cooperation of the Trustees of the Griffintown Club, the Centre was moved to its present quarters and given more staff and funds for a full-scale attack on problems of Rehabilitation.

The Centre comprises seven departments, namely, Medical, Physiotherapy, Occupational Therapy, Speech Therapy, Social Casework, Vocational Counselling and Placement Service. Although several or all of these Departments may cooperate in the rehabilitation of any one disabled person, for the purpose of clarity they will be discussed independently.

Medical Department—This Department is staffed by a part-time Chief Medical Officer, and a part-time Psychiatric Consultant. The functions of the Medical Officer include medical examinations, and reassessments of patients, liaison between the Centre and referring physicians, and hospitals, and arrangement for consultation with medical consultants in specialized fields when necessary. He attends all conferences and supplies the medical information on the patient for progress reports and discharge summaries.

The psychiatrist visits the Centre one half day per week and is available for consultation at other times.

Physiotherapy Department—This Department is staffed by four physiotherapists and is equipped with electro and hydrotherapy facilities, including a Hubbard Tank (Figure 1), a Whirlpool baths (Figure 2) and paraffin baths. Here the emphasis is on active exercise and training in functional activities such as bath-tub and toilet independence, use of prosthetic appliances such as artificial arms and legs, wheel-chairs, etc., and equipment accurately duplicating the use of public transportation.

Physiotherapy is prescribed according to the assessment of the patient on admission and may involve specific exercises for weakened muscles, joint mobilization, training in coordination, balance and correction of gait, and specialized electrical treatment. Group training in rhythm activities is used whenever possible in coordination with the Occupational Therapy Department.

After the original assessment, a programme of physical therapy is outlined, based on the needs of the patient and the requests of the referring physician. Reassessments are made at regular intervals and treatment modified as the patient progresses.

Occupational Therapy Department—The accent in this Department, staffed by four Occupational Therapists and a Craft Worker, is on the broad application of activity, each patient's programme being selected on an individual basis, both from the viewpoint of specific therapeutic value and interest in the particular activity.

"Self-help" is encouraged early in the treatment to promote the highest possible degree of independence in activities such as dressing, eating and the use of public transportation facilities.

Household activities are emphasized with women who will be returning to the responsibility of a home and family.

FIG. 1—FULL BODY IMMERSION TANK (HUBBARD TYPE)

Group activities and association with other similarly disabled persons, along with familiarity with simple kitchen adaptation promote greater self-reliance.

The group acceptance and the degree of social activity present in an occupational therapy department are particularly beneficial to individuals whose disability has necessitated a prolonged isolation from normal community life. Due to physical limitations imposed by their disability, many patients are unable to continue former interests and activities and are in need of less strenuous substitutes, the choice of which will necessarily be governed by the interests and aptitudes of each individual.

Before a patient can return to work, his tolerance

to activity and work must be increased through a gradually increased programme, the nature of which will depend on the type of work to which he plans to return. The Occupational Therapy Department duplicates many work situations and other types of activity designed for functional operations which will familiarize the patient with what to expect when he returns to work outside the Centre. Physical demands of the job are determined through specific work tests and performance evaluation is an important function of the Department.

Speech Therapy Department—The Centre is fortunate to have acquired the services of a well-qualified speech therapist whose function is to treat patients whose organs of speech and hearing have been impaired through accident, illness or emotional disturbance. (Figure 3) Loss or impediment of these faculties of communication is of very great concern to the patient and treatment of the impairment is an important part of total rehabilitation.

The general types of speech disorder encountered are: aphasia, stuttering, language difficulties, and speech difficulties resulting from loss of hearing, cerebral palsy, laryngectomy, articulatory defects and cleft palate.

Social Casework Department—The Centre employs two Medical Social Workers, one full-time and one part-time; the part-time worker also works at the Canadian Arthritis and Rheumatism Society, a good combination of services.

FIG. 2—WHIRLPOOL BATH

The Social Worker is the coordinating member of the rehabilitation team—both within the Centre and in relation to community agencies. He is responsible for assuring continued service to the patient in the Centre from admission to discharge. He is in a key position to interpret the function of the Centre to the community so that the referring agency is fully aware of the procedures to follow in making appropriate application for a patient. The success of treatment depends in no small measure on the patient's first contact with the Centre and so it is important that he understand the reason for his referral. The Social Worker provides continuity between the referring agency and the Centre, discusses with the patient how he can make optimum use of the services offered, and with his agreement, decides on the fee.

Near the end of treatment, the Social Worker assists the patient to decide on a good discharge plan, whether it be to return to his home, a job within his new range of abilities, or a routine of better self-care.

Vocational Counselling Department—The staff of this Department consists of two psychologists, one full-time and one part-time. The primary aim of vocational counselling is to assist the patient to become a productive, well-adjusted and independent individual in an occupation for which he is suited, both through aptitude and interest.

To this end the following services are performed:

1. Evaluation of vocational potential, by various means including consultation with other team members in the Centre and with outside professional personnel familiar with the case, assessment of interview data, observation of the patient during the rehabilitation process and psychological testing. Information accumulated from these sources provides a profile of the patient's vocational assets and limitations.

2. Vocational Training—If the patient shows an aptitude for an occupation which requires specialized training, efforts are made to obtain the desired courses, on-the-job apprenticeship or a combination of the two.

3. Occupational Information—An Occupational Library is maintained to provide current and local information about job requirements, opportunities, salaries and other pertinent information. Patients are encouraged to make use of this service.

4. Job Counselling—The patient is assisted to make his *own* decision about a choice of training or a job plan, based on the knowledge of himself which he has gained through testing, discussion and information about occupations. Patients are assisted in job-seeking, i.e., where to look for jobs, how to conduct themselves during interviews, how to make application for a job, how to hold a job and make advancement and where to get supplementary training.

Placement Service Department—A Placement Officer, who is provided through the National Employment Service, looks after placement of the patient in a job for which he is qualified and in which he can compete with able-bodied individuals. The Vocational Counsellor personally visits employers, industries, the specialized placement services of government employment bureaux, and sends letters and bulletins to employers regarding employment of the handicapped. This part of the program is directed not only towards job placement of individuals but also to the education

of the public regarding employment of disabled persons generally.

After employment, a patient's progress is followed up at regular intervals by consultation with both employer and patient and the patient is invited to discuss job or training problems with the vocational counsellor at any time.

Financial Operations of the Centre

The Centre is a part of the Welfare Federation and approximately 60 per cent of the total income is from this source. The Centre received its first provincial government grant for equipment in 1955; in 1956, as well as a provincial government grant for equipment, it received a matching provincial and federal grant for administration purposes.

FIG. 3—SPEECH THERAPY

A certain percentage of income comes from fees for treatment services. These fees are modified according to the patient's ability to pay, but no one is turned away from the Centre because he is unable to pay. Most patients work harder and achieve maximum benefits if they are required to pay, even though it be only a small sum. However, it is felt that one should not place too much stress on fees as potential sources of income, at the beginning of the rehabilitation program.

System of Referral

Referrals come from doctors, hospitals, social agencies, and from interested individuals. Patients are not taken over from referring doctors—the doctor is considered part of the rehabilitation team. Regular progress reports are sent to referring doctors and comments are invited. No change in treatment is instituted without first consulting the doctor and the patient, and the patient is always discharged back to the referring doctor.

Medical Advisory Board

This Board is made up of representatives of the various disciplines of medicine and consultations for patients are arranged very readily with the consent of the referring doctor. If a patient has not seen a doctor or attended a clinic for a year, he is accepted into the program after a preliminary examination and assessment by the Chief Medical Officer of the Centre.

Teaching Program

The Centre carries out a teaching program for third year medical students and orientation courses for public health nurses, medical Social Work Departments of hospitals, and other professional groups. Undergraduate and graduate interneship and field training are provided for physiotherapists, occupational therapists, social workers, and psychologists and other professions are included as the need arises.

Discussion

As was mentioned earlier, the emphasis is on the practical, particularly self-help and household activities, making use of simple equipment, as much as possible like that in the patient's own home. The Centre works closely with relatives, showing them what the patient can do, and how bathrooms and kitchens can be converted simply and practically for use by the disabled.

Since there are excellent facilities in Montreal for rehabilitation of very young children, the Centre does not work with this segment of the disabled population, but takes up where these services leave off. Patients are accepted at fourteen years of age and there is no upper age limit.

With younger people, there is not only the physical disability to contend with but also the normal emotional problems of adolescence. In addition, parents often have very unrealistic plans for the future of handicapped children. Much of the work of the Social Service and Vocational Counselling Departments is focussed on helping these young people and their parents to accept the limitations imposed by the disability and to adopt and carry out realistic plans.

The Centre works closely with the School for Crippled Children. Most disabled children attend the School and come to the Centre for a complete rehabilitation program. The Centre is unique in that it treats every type of disability, from accident, illness or emotional disturbance, the latter a very important phase of the work.

The Centre is operated outside of a hospital because experts agree that early removal from the hospital atmosphere of illness promotes more rapid rehabilitation and also releases a much needed hospital bed. This rehabilitation programme is not in competition with hospital or hospital rehabilitation programme but rather is complementary to them.

There is still need for further services, that is, vocational adjustment shop, home service and sheltered workshop.

Each community should work out its own plan for rehabilitation, based on needs and resources, and stressing coordination of services.

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Queen's Printer and Controller of Stationery, Ottawa,
1956.

OCCUPATIONAL HEALTH *Review*

Published by the Occupational Health Division Department of National Health and Welfare, Ottawa, with the co-operation of the department's Information Services Division and under the authority of the minister, the Hon. Paul Martin.

A QUARTERLY PUBLICATION